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FEMALE HORMONES MAY MAKE WOMEN LESS SUSCEPTIBLE TO KIDNEY FAILURE THAN MEN

Highlights

- Researchers detected transient increases in enzymes indicative of kidney health that correlated with specific phases of the female reproductive hormone cycle.
- The findings indicate that nonreproductive organs may undergo periodical adaptations phased by menstrual cycle–driven hormone changes.

More than 2 million people worldwide receive treatment for kidney failure.

Washington, DC (April 28, 2016) — Female hormones may play a role in women's decreased risk of developing kidney failure relative to men, according to a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN). The findings may be helpful for future attempts at safeguarding women's and men's kidney health in sex-specific ways.

Sex differences between men and women affect most, if not all, organ systems in the body, but there is a significant gap in knowledge of female physiology aside from organ functions involved in reproduction. Regarding the kidneys, while international registries show that fewer women than men develop kidney failure, the underlying causes are unknown.

To investigate, a team led by Judith Lechner, PhD and Thomas Seppi, PhD (Medical University of Innsbruck, in Austria) examined whether hormone changes due to the female menstrual cycle might affect the health of kidney cells. For this purpose, urinary samples from healthy women of reproductive age were collected daily and analyzed for menstrual cycle–associated changes of different proteins. Specifically, the researchers measured 2 enzymes—fructose-1,6-bisphosphatase and glutathione-S-transferase-alpha—that are found in proximal tubular cells, the most populous cell type in the kidney. When proximal tubular cells are damaged, these enzymes are released into the urine, making them important clinical markers for kidney injury.

The investigators detected transient increases of fructose-1,6-bisphosphatase and glutathione-S-transferase-alpha correlating with specific phases of the female reproductive hormone cycle, namely ovulation and menses. “This result suggests that cyclical changes of female hormones might affect kidney cell health, potentially providing

women with an increased resistance against kidney damage,” said Dr. Lechner. “It is conceivable that recurring changes of sex hormone levels, as brought about by the natural menstrual cycle, might be involved in periodic tissue re-modeling not only in reproductive organs, but to a certain extent in the kidneys as well.”

Understanding the mechanisms that might be responsible for women’s lower susceptibility to kidney failure may help researchers design better kidney-related therapies for women and men.

Study co-authors include Sinikka Prajczar, MD, PhD, Maria-Magdalena Dörler, Msc, Oliver Eiter, Daniel Hekl, Msc, Meinhard Nevinny-Stickel, MD, Iraida Skvortsova, MD, Gerhard Gstraunthaler, PhD, and Peter Lukas, MD.

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The article, entitled “Sex Differences in Renal Proximal Tubular Cell Homeostasis,” will appear online at <http://jasn.asnjournals.org/> on April 28 2016, doi: 10.1681/ASN.2015080886.

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